THE INSTITUTE OF PHYSICS

47 BELGRAVE SQUARE, LONDON, S.W.1

BULLETIN

No. 21 *Information in this circular is not intended for general publication: your copy should not therefore be passed to a library.* SEPTEMBER 1951

BRANCH AND GROUP HONORARY OFFICERS

Branch or Group	*Chairman*	*Honorary Secretary*
London and Home Counties	Dr. A. J. MADDOCK, F.Inst.P.	Mr. B. S. COOPER, F.Inst.P., Research Laboratories of the General Electric Co. Ltd., Wembley, Middlesex.
Manchester and District	Mr. W. J. MEREDITH, F.Inst.P.	Dr. A. HARGREAVES, F.Inst.P., College of Technology, Manchester.
Midland	Dr. D. PARKINSON, F.Inst.P.	Mr. W. C. HYND, A.Inst.P., Chance Bros. & Co. Ltd., Smethwick, Staffs.
North-Eastern	Mr. H. G. YATES, F.Inst.P.	Dr. N. THORLEY, F.Inst.P., King's College, Newcastle-upon-Tyne.
Scottish	Professor J. S. RANKIN, F.Inst.P.	Mr. J. MCNEILL, A.Inst.P., The University, Glasgow, W.2.
South Wales	Dr. T. V. I. STARKEY, F.Inst.P.	Mr. M. R. HOPKINS, F.Inst.P., The British Iron and Steel Research Association, Sketty Hall, Swansea.
Education	Mr. W. SOMERVILLE VERNON, F.Inst.P.	Dr. J. TOPPING, F.Inst.P., The Polytechnic, Regent Street, London, W.1.
Electronics	Mr. H. G. HUGHES, F.Inst.P.	Mr. G. W. WARREN, F.Inst.P., Research Laboratories of the General Electric Co. Ltd., Wembley, Middlesex.
Electron Microscopy	Professor W. T. ASTBURY, F.Inst.P., F.R.S.	Mr. F. W. CUCKOW, F.Inst.P., Chester Beatty Research Institute, Royal Cancer Hospital, Fulham Road, London, S.W.3.
Industrial Radiology	Mr. C. CROXSON, F.Inst.P. (*Joint*)	Mr. B. N. CLACK, F.Inst.P., The Radiochemical Centre, White Lion Road, Amersham, Bucks. Mr. R. MEAKIN, A.Inst.P., Armament Research Establishment, Ministry of Supply Depot, Ruddington, Notts.
Industrial Spectroscopy	Mr. D. M. SMITH, F.Inst.P.	Mr. K. DIXON, William Jessop & Sons Ltd., Brightside Works, Sheffield, 11.
Stress Analysis	Colonel H. T. JESSOP, F.Inst.P.	Mr. E. K. FRANKL, Engineering Laboratory, Cambridge.
X-Ray Analysis	Dr. W. H. TAYLOR, F.Inst.P.	Mr. A. E. De Barr, F.Inst.P., Research Laboratories of Elliott Bros. (London) Ltd., Boreham-wood, Herts.

BRANCH AND GROUP MEETINGS

Session 1951–52 (First Half)

This list gives details of all Branch and Group meetings so far arranged for the half session to the end of January 1952. Individual notification will be sent to all members of the Branch or Group concerned and further details may be obtained by other Institute members on application to the Secretary. Except where otherwise indicated, members may introduce guests without ticket.

Date 1951	*Place*	*Speaker*	*Title*	*Time*	*Branch or Group*
Oct. 9	**London** The Institute's House	**Prof. A. D. Ross, F.Inst.P.**	Experiences in education in science in Australia.	5.30 p.m.	Education
Oct. 10	**Newcastle-upon-Tyne** King's College	**Dr. K. Mendelssohn, F.Inst.P., F.R.S.**	Low-temperature physics.	6.15 p.m.	North-Eastern

Date 1951	*Place*	*Speaker*	*Title*	*Time*	*Branch or Group*
Oct. 11	**London** The Institute's House		**At Home.** (Attendance by ticket only.)	8.00 p.m.	London and Home Counties
Oct. 12	**London** The Institute's House		**At Home.** (Attendance by ticket only.)	8.00 p.m.	London and Home Counties
Oct. 16	**Glasgow** The University	**Prof. H. Hartridge, F.R.S.**	Recent work on the colour vision of men and animals.	7.00 p.m.	Scottish
Oct. 16	**London** The Institute's House	**Mr. R. W. Douglas, F.Inst.P.**	The physics of glass.	5.30 p.m.	Electronics
Oct. 18	**Birmingham** Imperial Hotel		Branch Annual General Meeting, followed by	6.30 p.m.	Midland
		Dr. W. Summer, A.Inst.P.	The industrial applications of ultra-violet radiation.	7.00 p.m.	
Oct. 19	**Manchester** The University	**Dr. G. D. Rochester, F.Inst.P.**	Cosmic rays.	7.00 p.m.	Manchester and District
Oct. 19	**London** The Institute's House		Tenth Anniversary of the Industrial Radiology Group.	6.30 p.m.	Industrial Radiology
		Mr. W. E. Schall, F.Inst.P.	Looking forward		
		Dr. L. Mullins, F.Inst.P.	Looking back		
		followed by supper for Group members only			
Oct. 20	**Cardiff** University College	**Prof. G. I. Finch, M.B.E., F.Inst.P., F.R.S.**	Electron diffraction and surface structure.	2.00 p.m.	South Wales
Oct. 24	**London** The Institute's House	**Dr. H. L. Penman, F.Inst.P.**	The role of vegetation in meteorology, soil mechanics and hydrology.	5.30 p.m.	London and Home Counties
Oct. 26	**Reading** The University	**Dr. H. L. Penman, F.Inst.P.**	The role of vegetation in meteorology, soil mechanics and hydrology.	5.30 p.m.	London and Home Counties
Nov. 2 and 3	**London** Institution of Electrical Engineers		**Autumn Conference.** The structures of silicate minerals.	2.15 p.m. on Nov. 2	X-ray Analysis
		(Evening lecture) **Dr. W. H. Taylor, F.Inst.P.**	Calcium silicates.		
			Felspars.	8.30 p.m. on Nov. 2	
			Clay minerals and asbestos.	9.45 a.m. on Nov. 3	
Nov. 7	**London** The Institute's House	**Dr. K. Mendelssohn, F.Inst.P., F.R.S.**	Phenomena near absolute zero.	5.30 p.m.	London and Home Counties
Nov. 7	**Newcastle-upon-Tyne** King's College	**Prof. A. M. Tyndall, F.Inst.P., F.R.S.**	Atomic particles and their tracks in photographic emulsions.	6.15 p.m.	North-Eastern
Nov. 10	**Birmingham** The University, Edgbaston	**Dr. D. S. Anderson** **Dr. M. R. Gavin, F.Inst.P.** **Dr. H. Lipson, F.Inst.P.**	Conference on the teaching of physics in technical colleges.	11.30 a.m.	Midland and Education
Nov. 10	**Newport, Monmouthshire** Newport Technical College	**Dr. A. B. D. Cassie, F.Inst.P.**	Moisture relations of fibres.	2.00 p.m.	South Wales
Nov. 13	**London** The Institute's House	**Dr. F. Ashworth, F.Inst.P.**	Electrical properties and structure of evaporated films.	5.30 p.m.	Electronics

Date	*Place*	*Speaker*	*Title*	*Time*	*Branch or Group*
1951					
Nov. 13	**Glasgow** The University	**Col. H. T. Jessop, F.Inst.P.**	Photoelasticity.	7.00 p.m.	Scottish
Nov. 14	**Edinburgh** The University	**Col. H. T. Jessop, F.Inst.P.**	Photoelasticity.	7.00 p.m.	Scottish
Nov. 16	**London** The Institute's House		The design of X-ray tubes. (Joint meeting with the Institute of X-ray Technology.)	6.30 p.m.	Industrial Radiology
Nov. 16	**Manchester** The University	**Mr. W. J. Meredith, F.Inst.P.**	Recent advances in the applications of physics to medicine.	7.00 p.m.	Manchester and District
Dec. 1	**Swansea** University College		Branch Annual General Meeting, followed by		
		Dr. T. V. Starkey, F.Inst.P.	Administration and the physicist.	2.00 p.m.	South Wales
Dec. 6	**Newcastle-upon-Tyne** King's College	**Dr. B. P. Dudding, F.Inst.P.**	Forty years in industrial research.	6.15 p.m.	North-Eastern
Dec. 11	**London** The Institute's House	**Dr. G. F. J. Garlick, F.Inst.P.**	Recent research in electron and particle excited luminescence and its practical significance.	5.30 p.m.	Electronics
Dec. 11	**Glasgow** The University	**Prof. D. R. Hartree, F.Inst.P., F.R.S.**	Using an automatic calculating machine.	7.00 p.m.	Scottish
Dec. 12	**London** The Royal Institution	**Sir Robert Watson-Watt, C.B., F.R.S.**	(To be announced.)	5.30 p.m.	London and Home Counties
Dec. 12	**Edinburgh** The University	**Prof. D. R. Hartree, F.Inst.P., F.R.S.**	Using an automatic calculating machine.		Scottish
Dec. 13	**Birmingham** The General Electric Co. Ltd., Witton		Visit to the Development Laboratory of the General Electric Co. Ltd. (numbers limited), followed by	2.30 p.m.	Midland
		Dr. W. Wilson, F.Inst.P.	The organization of a development laboratory.	6.00 p.m.	
		Mr. F. S. Beachey	The patent law with relation to development.		
Dec. 14	**Manchester** The University	**Dr. J. Weston**	Full-scale heating research.	7.00 p.m.	Manchester and District
Dec. 14	**London** The Institute's House		Applications of tracers in industrial research.	6.30 p.m.	Industrial Radiology
1952					
Jan. 18	**Manchester** The University	**Dr. L. A. Sayce, F.Inst.P., F.R.I.C.**	Light, colour and radiation.	7.00 p.m.	Manchester and District
Jan. 23	**London** The Institute's House	**Mr. T. A. Eames, F.Inst.P.**	(To be announced.)	5.30 p.m.	London and Home Counties
Jan. 23	**Rugby**		Visit to the Laboratories of the British Thomson Houston Co. Ltd. (numbers limited), followed by	3.30 p.m.	Midland
		Dr. D. Tabor	Boundary lubrication.	6.00 p.m.	

NOTES ON TERMS OF ENGAGEMENT OF PHYSICISTS

Addendum; Patent Rights

The following information, supplementing that contained in Clause 11 *of the notes on terms of engagement published in the July* 1951 BULLETIN, *has been kindly supplied by Mr. F. W. G. Greener (Associate), a Chartered Patent Agent.*

It is true that an employer is entitled, by law, in the United Kingdom, to the full benefit of patent rights in an invention produced by an employee as part of the work for which he is engaged. Nevertheless the employee is entitled to be named, in the patent specification, as the inventor. This gives the employee no claim to financial or other benefit but may have considerable prestige value.

Rights in foreign patents are, of course, governed by the patent laws of the different countries, not always the same as British law. Thus, not all countries recognize an employer's right, in the absence of a contract to that effect entered into by an employee, to unqualified ownership and benefits of the employee's invention without compensation. It should also be remembered that under an International Convention the filing of a British Patent Application establishes rights to apply for similar protection during the subsequent twelve months in most of the important countries of the world, and these rights are valuable. An employer will probably, quite rightly, claim an option to apply for foreign patents, wherever he chooses, during the twelve months allowed, in respect of the employee's inventions. It does not follow that the employee should agree to that course without prior agreement whereby he receives compensation, e.g. a share of profits derived from oversea patent rights. Moreover the employee might wish to arrange that in those foreign countries where the employer does not exercise his option, he (the employee) can apply for patent rights personally, or with the help of third parties, for his own benefit and advantage.

It is clearly desirable that points such as indicated above should be settled before a service contract is entered into, and the agreed arrangements included in the contract. It might, however, be mentioned that the Patents Act, 1949, now in force, contains a new provision for settlement by the Comptroller of Patents of any dispute between employer and employee, on patent matters, at the request of either party.

It is in the interest of both employers and employees to have these matters clearly defined when entering into an agreement, and since this branch of Patent Law is not simple, professional advice and assistance when such questions are under consideration is most desirable.

NOTICES TO MEMBERS

Journal Back Numbers

The Institute is urgently in need of a few copies of each of the back numbers of the *Journal of Scientific Instruments* listed below, in order to make up some complete volumes. Ten shillings each will be paid for the following parts. **No other parts are required at present.**

Volume 17	Index only.
Volume 18	Parts 4, 10 and 11.
Volume 19	Parts 4, 6, 8 and 9.
Volume 20	Parts 11 and 12 with Index.
Volume 22	Part 12 with Index.
Volume 23	Index only.
Volume 26	Part 10.

Recognition of Technical Colleges

The Board is continuing to receive requests from technical colleges for recognition for the purposes of the Institute's membership regulations which demand the completion of a course of study at an approved institution as a condition of membership and of admission to the newly established Graduateship examination. Recognition is granted only after a satisfactory report has been received from representatives of the Membership Committee who have visited the college and inspected its facilities.

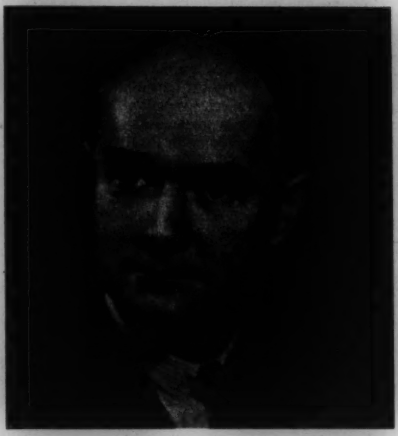
The Board's aim in following this procedure is to assist in raising the standard of teaching in colleges and the status of the physicists engaged in this work. The co-operation of college Principals and staffs and of representatives of the Ministry of Education has been most warm and there is much solid evidence of substantial improvement which has resulted from suggestions made by the Institute.

Recognition has recently been granted to the City of Liverpool Technical College, Mid-Essex Technical College, Chelmsford, Derby Technical College, and the City of Gloucester Technical College. The total of recognized colleges is now thirty-six; a full list is given in the handbook concerning the Graduateship examination, copies of which are available on request.

"*In our own day it would not be an unfair description of education to define it as the art which teaches men to be deceived by the printed word.*"

H. J. LASKI.

MEMBERS OF NOTE



Thomas Edward Allibone, D.Sc., F.R.S. (*Vice-President*). Dr. Allibone graduated in physics in the University of Sheffield in 1924 and obtained his Ph.D. in 1926 for research in metallurgy. He spent the next four years in the Cavendish Laboratory, Cambridge, working on the acceleration of electrons by direct methods and was awarded the 1851 Senior Exhibition.

In 1930, then aged 26, Dr. Allibone was appointed to take charge of the High Voltage Laboratory of the Metropolitan-Vickers Electrical Company Limited, where he was able to continue his work on the acceleration of electrons to high speeds. He was also interested in spark phenomena, collaborating with Schonland and, later, Meek in relating spark to lightning phenomena. During the War, Dr. Allibone's work included high-voltage acceleration of particles in uranium isotope separation by electro-magnetic methods and he was seconded to the atomic bomb project in Oakridge, Tennessee and at the University of California.

In 1946 Dr. Allibone took charge of the new laboratory of Associated Electrical Industries Ltd. at Aldermaston, Berkshire. This laboratory is concerned with long-term research problems of a physical, chemical and metallurgical character. In 1948, Dr. Allibone was elected to Fellowship of the Royal Society. He became a Fellow of the Institute of Physics in 1947 and was elected a Vice-President the following year. He is also a Member of the Institution of Electrical Engineers.

Ernest Gordon Cox, T.D., D.Sc. (*Vice-President*). Professor Cox is one of Professor Tyndall's former students and graduated at Bristol with first class honours in physics in 1927; he was awarded his D.Sc. in 1936. For two years (1927–29) he was a research assistant at the Davy–Faraday Laboratory of the Royal Institution when the late Sir William Bragg was Director and he has always felt himself exceptionally fortunate in having come under the influence of two such men as A. M. Tyndall and W. H. Bragg, not only great scientists but lovable human beings.

Professor Cox spent sixteen years on the staff of the chemistry department of the University of Birmingham, eventually being senior lecturer in physical chemistry and Reader in chemical crystallography. In 1945 he was appointed Professor of Inorganic and Physical Chemistry in the University of Leeds. His research has been mostly in the field of crystallography, on the structure of carbohydrates and of co-ordination compounds. Professor Cox's department was the first university crystallographic laboratory to tackle the problem of computation in crystallographic work by installing punched-card equipment.

At the outbreak of war, Professor Cox was called up with the Territorial Army and for a short time was assistant adjutant of a reception unit. Later, after being in charge of a special War Office laboratory for two years, he served as a Technical Staff Officer, Grade I, at 21st Army Group H.Q. in N.W. Europe.

Professor Cox was elected to Fellowship of the Institute of Physics in 1935. From 1946 to 1949 he served on the Board as Chairman of the Manchester

and District Branch and in 1950 was elected a Vice-President; he has represented the Institute on the National Committee for Crystallography since 1948. He has also been a Fellow of the Royal Institute of Chemistry since 1947 and is at present Chairman of the Leeds Area Section of that Institute.

James Topping, M.Sc., Ph.D. (*Vice-President-elect*). Dr. Topping was born in Lancashire in 1904 and graduated in 1924 in the University of Manchester with first class honours in mathematics. He then came to Imperial College, London, with Professor S. Chapman, was Beit Research Fellow in mathematical physics during 1926–28 and a member of the College staff for the next two years. Following lectureships at Chelsea Polytechnic and Manchester College of Technology, Dr. Topping was appointed Head of the Department of Mathematics and Physics at The Polytechnic, Regent Street, in 1937 and still holds this post. He has published a number of papers on mathematical physics in the *Proceedings* of the Royal Society and elsewhere and is the joint author of a successful text book on mechanics.

Elected to Fellowship of the Institute of Physics in 1943, Dr. Topping has given very great service to the Institute, particularly on the educational side. After service on the committee of the London and Home Counties Branch, he was elected an Ordinary Member of the Board in 1947 and earlier this year was elected to take office as a Vice-President in October. For two years he has been Chairman of the Membership Committee of the Board and for four years has served on the Education Committee. Dr. Topping has also been one of the Institute's representatives on the Joint Committee with the Ministry of Education for National Certificates in Applied Physics; for the past two years he has been the Joint Committee's assessor in mathematics for the Certificate examinations.

When the Institute's Education Group was established in 1949, Dr. Topping was asked to become its Honorary Secretary, having already taken an active part in the earlier meetings from which the Group sprang; he still fills this office and has been largely responsible for the excellent standard of the Group's meetings and conferences which have already attracted notice outside the membership of the Institute.

SUMMER MEETINGS

Education Group

More than 80 members and friends joined the Education Group visit to the Royal Naval College, Greenwich, on June 30th; most of the party went by river from Westminster.

The photograph printed on this page was taken on the river by Mr. T. H. Tyler (Associate).

Electronics and Education Groups

A successful joint meeting was held in Cambridge on July 20th–21st, most of the members staying one night in college. In addition to lectures, visits were arranged to the Cavendish Laboratory and the Engineering Laboratory.

London and Home Counties Branch

Nearly 100 members and guests joined the visit to the Cavendish Laboratory on July 21st, followed by a conducted tour of colleges.

Industrial Radiology Group

About 80 members attended the lectures and discussions on July 23rd–25th. An exhibition of apparatus and radiographs was arranged as part of the meeting.

THE REGISTER

ELECTIONS TO MEMBERSHIP

Asterisk (*) indicates transfer from another grade.

Fellows

*Berenblut, Israel Isaac, M.Sc., Mathematical Physicist, Shell Petroleum Co. Ltd., London.
*Birks, John Betteley, B.A., Ph.D., Professor of Physics, Rhodes University College, South Africa.
Brown, Robert Leslie, M.A., Director of Research Laboratories, British Coal Utilisation Research Association, Surrey.
*French, Henry William, B.Sc., H.M. Inspector of Schools, Ministry of Education.
*Fewkes, John Henry, B.Sc., Ph.D., Senior Assistant, Department of Mathematics and Physics, The Polytechnic, Regent Street, London.
*Lang, William Rawson, B.A., M.Sc., Head of Textile College, Gordon Institute of Technology, Geelong, Australia.

Associates

Bewley, David Kevin, B.A., Assistant Physicist (Research), Hammersmith Hospital, London.
*Box, Derrick Stanley, B.Sc., Physicist, The Fulmer Research Institute, Bucks.
Brett, Percy Rollo, B.Sc., Physicist, Research Laboratories, Post Master General's Department, Australia.
Christian, John Wyrill, M.A., D.Phil., Demonstrator in Metallography, Inorganic Chemistry Laboratory, Oxford.
Cull, Henry John, B.Sc., A.R.C.S., D.I.C., Senior Lecturer in Physics, College of Technology, Birmingham.
Heddle, Trevor Arnold, B.Sc., Research Worker, British Scientific Instrument Research Association, Chislehurst, Kent.
Holden, Jack, B.Sc., Senior Lecturer in Physics, College of Technology, Leeds.
Lewin, George Farley, B.A., D.Phil., Senior Lecturer in Physics, Acton Technical College.
*Martin, David James Reginald, B.Sc., Research Worker, British Scientific Instrument Research Association, Chislehurst, Kent.
Martin, Ernest Norman, B.A., Technical Officer, Imperial Chemical Industries Ltd. (Billingham Division), Durham.
Swaminathan, Krishnaiyer, M.Sc., Chargeman, Ordnance Factory, Dehra Dun, India.
Urquhart, Donald Ferguson, B.Sc., Geophysicist, Bureau of Mineral Resources, Department of Supply and Development, Melbourne, Australia.
*Watson, Arthur Francis, B.Sc., Assistant Chief, Instrument Laboratory, Morgan Crucible Co. Ltd., London.
*Westerman, Kenneth, M.Sc., Research Officer, British Cotton Industry Research Association, Manchester.
Williams, Emrys, B.Sc., Lecturer in Physics, Wolverhampton and Staffordshire Technical College.

Graduates

Abrams, Arnold Aaron, B.Sc., Research and Development Department, Wilmot Breeden Ltd., Birmingham.
*Burchell, Charles Kasper, B.Sc., Radar Instructor, R.E.M.E.
Burton, Roy Harold, B.A., Physicist, Datwyler A-G, Swiss Wire, Cable and Rubber Co. Ltd., Switzerland.
*Chatburn, Gerald, B.Sc., Works Assistant, Ministry of Supply, Division of Atomic Energy (Production).
Common, Thomas Charles, B.Sc., Research Student, University College, Exeter.
*Evans, Graham, B.Sc., Physicist, Lever Bros. and Unilever Ltd., Sharnbrook.
*Fenton, Frederick Charles, B.Sc., Science Master, King Edward's Grammar School, Aston, Birmingham.
*Godsall, Ruth Mary, B.Sc., Physics Mistress, Girls' Grammar School, Gowerton.
*Kerr, Leslie Wilson, B.Sc., Assistant Lecturer, Queen's University, Belfast.
Kiss, Alan Edwin, B.Sc., Lecturer in Physics, Sir John Cass College, London.
Mead, Henry John, B.Sc., Assistant Lecturer, Northern Polytechnic, London.
*Morrison, Trevor Walter, B.Sc., Senior Education Officer, Schools, Halton.
Noakes, James William, B.Sc., Assistant Lecturer in Physics, Municipal College, West Ham.
Peakin, Kelvin Richard, B.Sc., Physicist, Instrumentation Section, Distillers Co. Ltd., Epsom, Surrey.
*Reeves, Eric Valentine, B.Sc., Physicist, Courtaulds Ltd., Coventry.
Riley, Robert, B.Sc., Senior Physics Master, Thornleigh College, Bolton.
Roberts, Wilfred, B.Sc., Technical Officer, British Ceramic Research Association, Staffs.
*Salthouse, Brian, B.Sc., Physics Master, Urmston Grammar School, Lancashire.
Weston, Ronald Edmund, B.Sc., Refinery Physicist, "Shell" Refining and Marketing Co. Ltd., Ellesmere Port, Cheshire.
Wright, Peter William, B.Sc., Scientific Officer, British Iron and Steel Research Association, Swansea.

Subscribers

Lewin, Philip Ian, Student, Queen Mary College, University of London.
Murphy, Patrick, Head of Chemical Division, Aluminium Laboratories Ltd., Oxford.
Shaw, John Leonard, Instrument Manufacturer, Bradford.
Treasure, Howard Lawrie, Chief Radiographer, De Havilland Propellers Ltd., London.
Wood, John, Assistant Chief Metallurgist, International Alloys Ltd., Aylesbury.

Students

Coleman, C. R., University of Birmingham.
Cross, S. H., South-East London Technical College.
Ford, D. R. G., South-East London Technical College.
James, E. W., South-East London Technical College.
Thomson, H. J., University of Melbourne, Australia.
Tims, D. W., South-East London Technical College.

DECEASED

Fellows—L. G. Grimmett, E. P. Metcalfe, C. W. Ockelford.
Associate—M. Barbanel.

APPOINTMENTS VACANT

The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.

Woman graduate with honours degree in mechanical engineering or physics for experimental work in connection with stress analysis. Age 20–25. Salary in accordance with experience and qualifications. **T.I. (Group Services) Limited,** Plume Street, Aston, Birmingham.

Applications are invited by the **Ministry of Supply** for the following unestablished appointments at the Royal Aircraft Establishment, Farnborough, Hants:—

Physicists or **Mathematical Physicists.**

(1) **Principal Scientific Officer.** Candidates should have experience of Radar systems analysis and war-time operational research. A strong mathematical bias is desirable. Ref. A 133/51A/BF.

(2) **Senior Scientific Officer,** for theoretical investigations. A knowledge of statistical methods is desirable. Ref. A 134/51A/BF.

Aeronautical Engineer.

(3) **Senior Scientific Officer,** with experience in planning and analysis of flight trials and application of results to project design. A knowledge of servo mechanism theory and practice is required, experience of liaison with industrial firms an advantage. Ref. C 217/51A/BF.

Physicists, Mathematicians or **Engineers.**

(4) **Senior Scientific Officer,** with research experience involving arithmetical applications of mathematics in the analysis of physical data, and the formulation of problems for solution by automatic computing machinery. A knowledge of aerodynamics an advantage. Ref. A 135/51A/BF.

(5) **Senior Scientific Officer,** with wide experience of methods of measurement in physics or engineering research, experience and up-to-date knowledge of electronics. Ref. A 136/51A/BF.

Candidates should have a first or second class honours degree in the appropriate subject and at least 3 years post-graduate research experience is necessary. For the P.S.O. post candidates must be at least 31 years of age, for the S.S.O. post at least 26 years. Salary will be determined on age and on an assessment of the successful candidates' qualifications and experience with the ranges; Principal Scientific Officer—£960–£1,295. Senior Scientific Officer—£720–£910. Rates for women somewhat lower. Application forms obtained from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting appropriate reference number. Closing date September 22, 1951.

Physicists and **mathematicians** are invited by the **Ministry of Supply** to apply for the following unestablished appointments in the Scientific Officer class at an Experimental Establishment in Essex for work connected with out-of-door instrumentation.

Senior Scientific Officer.

(1) **Physicist** with some mathematical knowledge including statistics or a statistician with some interest in experimental procedure to be in charge of a team investigating the performance of weapons.

Scientific Officers.

(2) **Physicists,** preferably with some knowledge of experimental range technique and procedure. For some posts a knowledge of electronics is required.

(3) **Experimental physicist** with experience of metallurgical techniques.

(4) **Mathematician** with interest in experimental methods, and some knowledge of hydrodynamics.

Candidates must possess a first or second class honours degree in appropriate subject, or equivalent qualification. For the senior grade candidates should be at least 26 years of age with a minimum of three years' post-graduate research experience. Salary will be determined on age and on an assessment of the successful candidate's qualifications and experience within the ranges; Senior Scientific Officer—£720–£910. Scientific Officer—£380–£620. Rates for women somewhat lower. Posts carry benefits of F.S.S.U. Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, London, W.C.2, quoting A220/51/A. Closing date September 24, 1951.

A large food manufacturing company has a vacancy on the research staff for a **senior physical chemist.** Candidates should have a first or second class honours degree. The post offers scope for quick promotion and carries a good pension scheme. Applications stating age, qualifications and experience to Box No. A.V. 17, The Institute of Physics, 47 Belgrave Square, London, S.W.1.

Applications are invited from well-qualified **physicists, chemists** or **electrical engineers** with post-graduate experience for posts involving basic research on the electrical properties of materials, particularly dielectrics. The starting salaries will be in the range £500–£750 per annum according to experience and age. Applications should be addressed to The Director, **The Electrical Research Association,** 5 Wadsworth Road, Perivale, Middlesex.

The Governors of **Sir John Cass College,** Jewry Street, London, E.C.3, invite applications for the post of full-time **senior lecturer in physics.**

A higher degree together with suitable teaching and research experience are essential qualifications. The work is of university standard in physics. Salary according to the Burnham (Technical) Scale 1951 (£1 000—£25—£1 150 for men or £800—£20—£920 for women plus London allowance of £36 or £48).

Details and form of application, which should be returned as soon as possible, may be obtained from the Principal.

The **General Electric Company,** Research Laboratories, Wembley, Middlesex, have openings for **physicists** in a number of fields of experimental work including semiconductors, magnetic materials, magnetrons, microwave equipment, high frequency heating and fluorescent powders. The Staff Manager (Ref. GBLC/817) will be pleased to consider applications from candidates available during the next three months.

Electronic Engineers are invited to apply for appointments in the **Ministry of Supply** to work near London or at provincial stations on the development and design of electrically-operated systems for a variety of applications including weapons, telecommunications and radar equipment. The responsibilities of the posts will vary according to the age, qualifications and experience of the selected candidates, and acceptable qualifications range from first or second class honours degrees in physics or light electrical engineering or equivalent qualifications, corporate membership of the Institution of Electrical Engineers to Higher School Certificate, Higher National Certificate, etc. Grade and entering salary will be determined after interview on ranges up to approximately £1 000 a year. Some posts carry F.S.S.U. benefits, but all are unestablished. Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting D.134/51A. Closing date September 24, 1951.

Electrical engineers and **physicists** are invited by the **Ministry of Supply** to apply for unestablished appointments in the grade of **Senior Scientific Officer** at the Royal Aircraft Establishment, Farnborough, Hants. Candidates should be at least 26 years of age and have a first or second class honours degree in the appropriate subject and at least three years' post-graduate research experience. They should also have a wide knowledge of communications work and H.F., V.H.F., or display techniques for research work associated with design and development of airborne and ground equipments. Salary will be determined on age and on an assessment of the successful candidate's qualifications and experience within the S.S.O. range £720–£910. Rates for women somewhat lower. Posts carry benefits of F.S.S.U. Application forms obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting D159/51-A. Closing date September 22, 1951.

Telecommunications engineers and **physicists** are invited by the **Ministry of Supply** to apply for unestablished appointments in the grade of **Principal Scientific Officer** or **Senior Scientific Officer** at the Royal Aircraft Establishment, Farnborough, Hants. Candidates should have a first or second class honours degree in physics or telecommunications and upwards of five years' experience of research and development in one of the following: R.F. techniques at centimetric wavelengths; centimetric radar, preferably for airborne application; servo systems or telecommunication networks and feedback amplifiers. For the P.S.O. grade candidates must be at least 31 years of age and for the S.S.O. grade at least 26. Salary will be determined on age and on an assessment of the successful candidates' qualifications and experience within the ranges; Principal Scientific Officer £960–£1,295, Senior Scientific Officer £720–£910. Rates for women somewhat lower. Posts carry benefits of F.S.S.U. Application forms obtained from Ministry of Labour and National Service, Technical and Scientific Register (K), York House, Kingsway, W.C.2, quoting D158/51A. Closing date September 22, 1951.

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